

<b>Notice of Allowability</b>	Application No.	Applicant(s)	
	10/782,990	BALL ET AL.	
	Examiner	Art Unit	
	Mujtaba K. Chaudry	2133	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to interview 1/16/2007.
2. ☒ The allowed claim(s) is/are 1-46.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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| <ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br/>Paper No./Mail Date <u>11/8/2005</u></li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application</li> <li>6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date <u>1/7/2006</u></li> <li>7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____</li> </ol> |
|--|--|

  
 ALBERT DECADY  
 SUPERVISORY PATENT EXAMINER  
 TECHNOLOGY CENTER 2100

 1/16/07  
 U.S. Patent and Trademark Office  
 PTOL-37 (Rev. 08-06)

**EXAMINER'S AMENDMENT**

An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Peter J. Yim on January 16, 2007. See interview summary attached.

Please amend the application as follows:

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**Please replace claim 23 with:**

23. A data storage device configured to correct errors in data retrieved from a storage medium, comprising:

    a data buffer configured to hold data blocks and one or more redundancy blocks retrieved from the storage medium; and

    a decoder connected to the data buffer, the decoder having:

        a plurality of cells that access the data blocks and one or more redundancy blocks held in the data buffer, each cell configured to generate a partial syndrome based on the retrieved data blocks and one or more redundancy blocks, and to generate a partial error

value based on the partial syndrome and a portion of an inverse of an error location matrix; and

a summation logic connected to the plurality of cells, the summation logic configured to generate an error value based on the partial error values generated by the plurality of cells, wherein the error value corrects errors in a data block.

**Please replace claim 40 with:**

40. The method of claim 39, further comprising:

j) repeating steps f) and g) and steps h) and i) to correct another data block having errors.

**Please replace claim 41 with:**

41. The method of claim 40, wherein the number of iterations of steps f) to g) and steps h) and i) is equal to the number of data blocks having errors.

**Please replace claim 42 with:**

42. The method of claim 40, wherein the number of iterations of steps f) to g) and steps h) and i) is equal to the number of redundancy blocks held in the data buffer.

**Please replace claim 43 with:**

43. The method of claim 40, wherein the sum is cleared and steps a) to e), steps f) and g), steps h) and i), and step j) are repeated to process another portion of the data blocks and one or more redundancy blocks held in the data buffer.

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### REASONS FOR ALLOWANCE

Claims 1-46 are allowed. The following is an Examiner's statement of reasons for allowance:

Independent claim 1 of the present application teaches a decoder to correct errors in data, comprising: a plurality of cells, each cell configured to generate a partial syndrome based on data blocks and one or more redundancy blocks, and to generate a partial error value based on the partial syndrome and a portion of an inverse of an error location matrix that identifies locations of any data blocks having errors; and a summation logic connected to the plurality of cells, the summation logic configured to generate an error value based on the partial error values generated by the plurality of cells, wherein the error value corrects errors in one of the data blocks. The foregoing limitations are not found in the prior arts of record. Particularly, none of the prior arts of record teach nor fairly suggest, “...to generate a partial error value based on the partial syndrome and a portion of an inverse of an error location matrix that identifies locations of any data blocks having errors; and a summation logic connected to the plurality of cells, the summation logic configured to generate an error value based on the partial error values generated by the plurality of cells, wherein the error value corrects errors in one of the data blocks.”

Dependent claims 2-22 depend from allowable independent claim 1 and inherently include limitations therein and therefore are allowed as well.

Independent claim 23 of the present application teaches a data storage device configured to correct errors in data retrieved from a storage medium, comprising: a data buffer configured to hold data blocks and one or more redundancy blocks retrieved from the storage medium; and a decoder connected to the data buffer, the decoder having: a plurality of cells that access the data

blocks and one or more redundancy blocks held in the data buffer, each cell configured to generate a partial syndrome based on the retrieved data blocks and one or more redundancy blocks, and to generate a partial error value based on the partial syndrome and a portion of an inverse of an error location matrix, and a summation logic connected to the plurality of cells, the summation logic configured to generate an error value based on the partial error values generated by the plurality of cells, wherein the error value corrects errors in a data block. The foregoing limitations are not found in the prior arts of record. Particularly, none of the prior arts of record teach nor fairly suggest, “...to generate a partial error value based on the partial syndrome and a portion of an inverse of an error location matrix, and a summation logic connected to the plurality of cells, the summation logic configured to generate an error value based on the partial error values generated by the plurality of cells, wherein the error value corrects errors in a data block.”

Dependent claims 24-32 depend from allowable independent claim 23 and inherently include limitations therein and therefore are allowed as well.

Independent claim 33 of the present application teaches a method of correcting errors in data, comprising: receiving data blocks and one or more redundancy blocks; generating an inverse of an error location matrix with locations of any received data blocks with errors; generating a plurality of partial syndromes in a plurality of cells of a decoder, wherein each one of the plurality of partial syndromes are generated in each one of the plurality of cells based on the received data blocks and one or more redundancy blocks; generating a plurality of partial error values in the plurality of cells, wherein each one of the plurality of partial error values are generated in each one of the plurality of cells based on a partial syndrome and a portion of the

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inverse of the error location matrix; and generating an error value based on the plurality of partial error values generated by the plurality of cells. The foregoing limitations are not found in the prior arts of record. Particularly, none of the prior arts of record teach nor fairly suggest,

*“...generating a plurality of partial error values in the plurality of cells, wherein each one of the plurality of partial error values are generated in each one of the plurality of cells based on a partial syndrome and a portion of the inverse of the error location matrix; and generating an error value based on the plurality of partial error values generated by the plurality of cells.”*

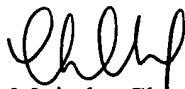
Dependent claims 34-46 depend from allowable independent claim 33 and inherently include limitations therein and therefore are allowed as well.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mujtaba K. Chaudry whose telephone number is 571-272-3817. The examiner can normally be reached on Mon-Thur 9-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Mujtaba Chaudry  
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January 16, 2007

  
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